

H. LIEBERTHAL.  
WHEEL.

(Application filed June 15, 1901.)

(No Model.)

Fig. 1.

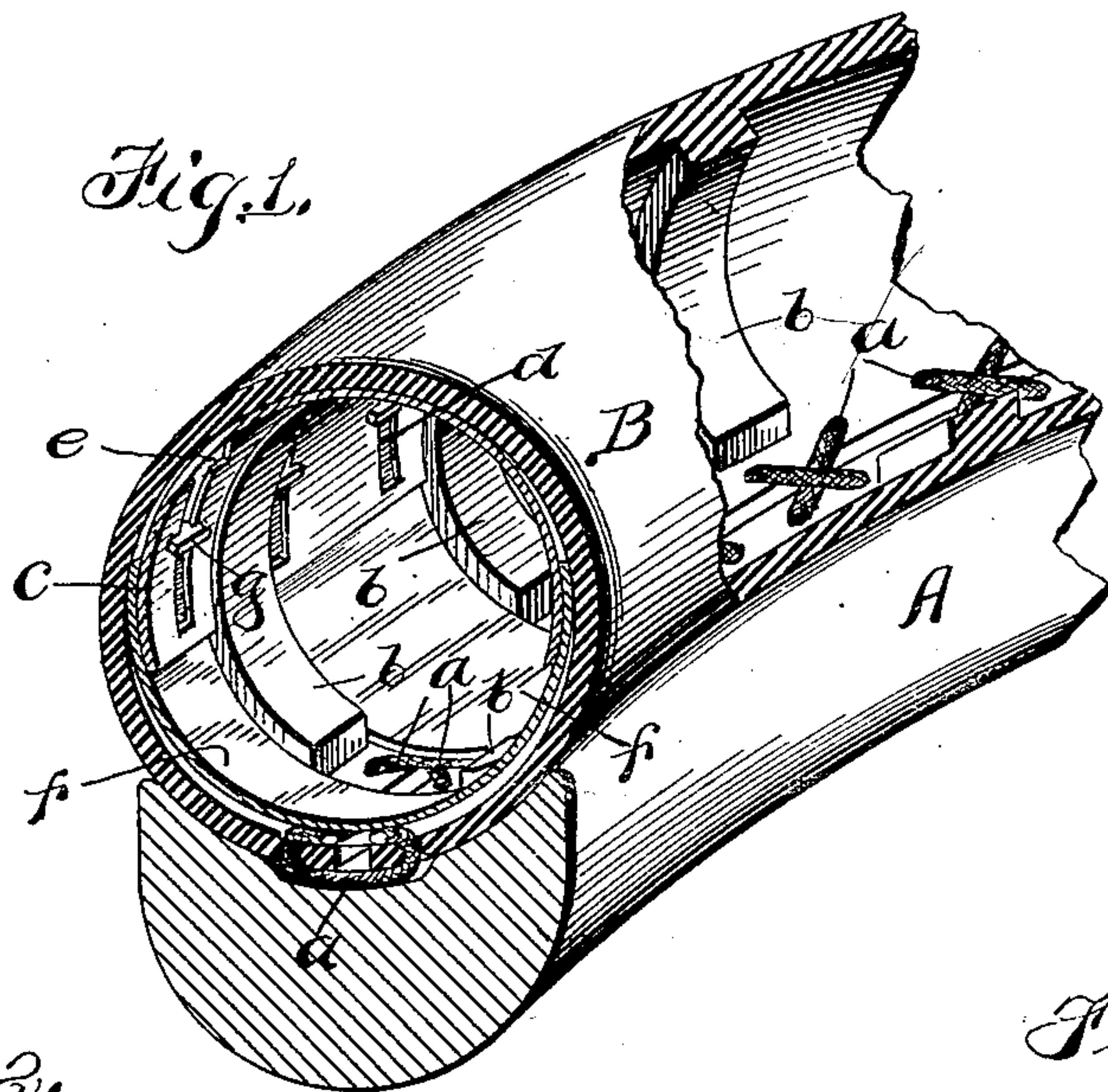


Fig. 2.

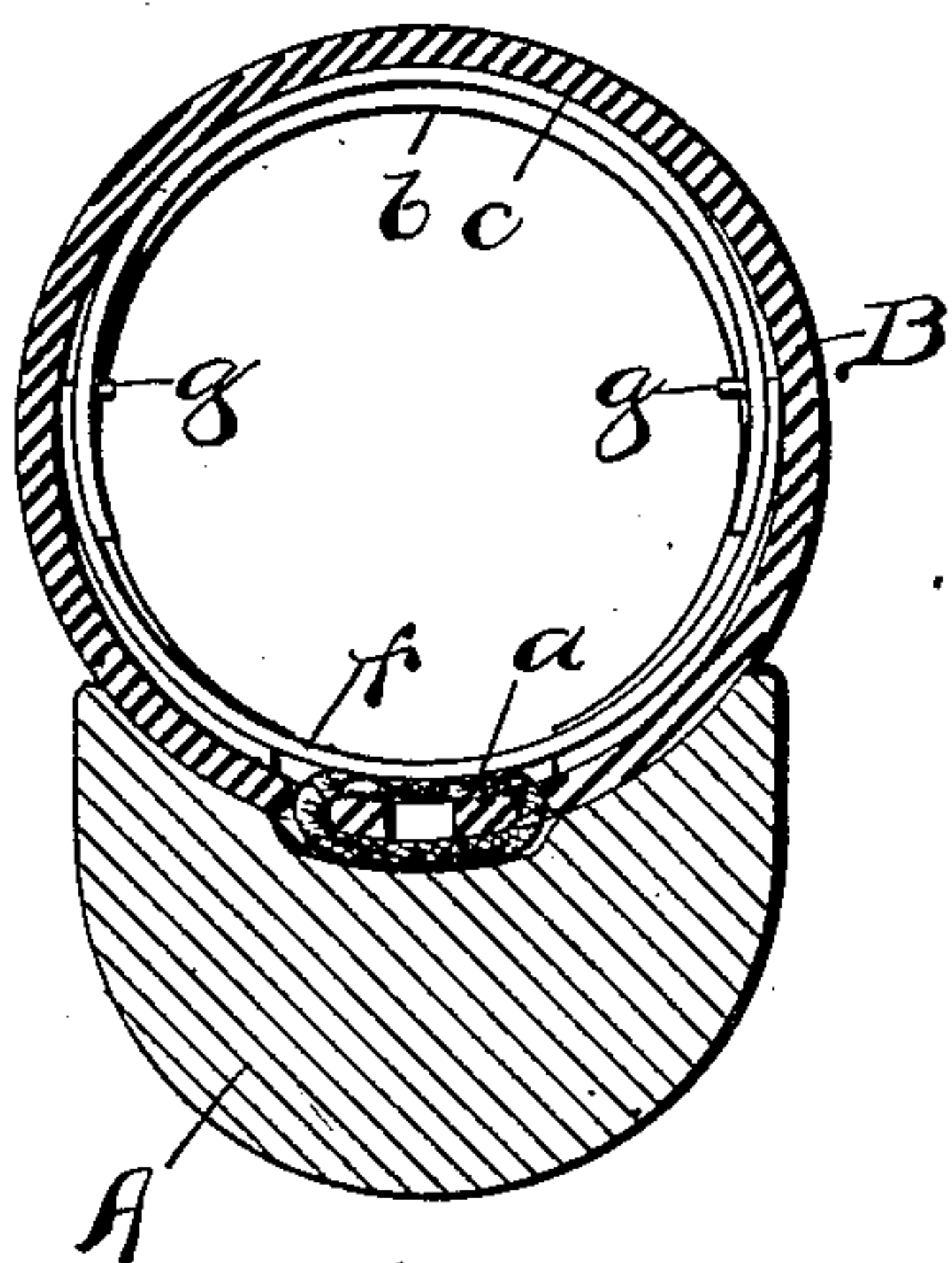


Fig. 4.

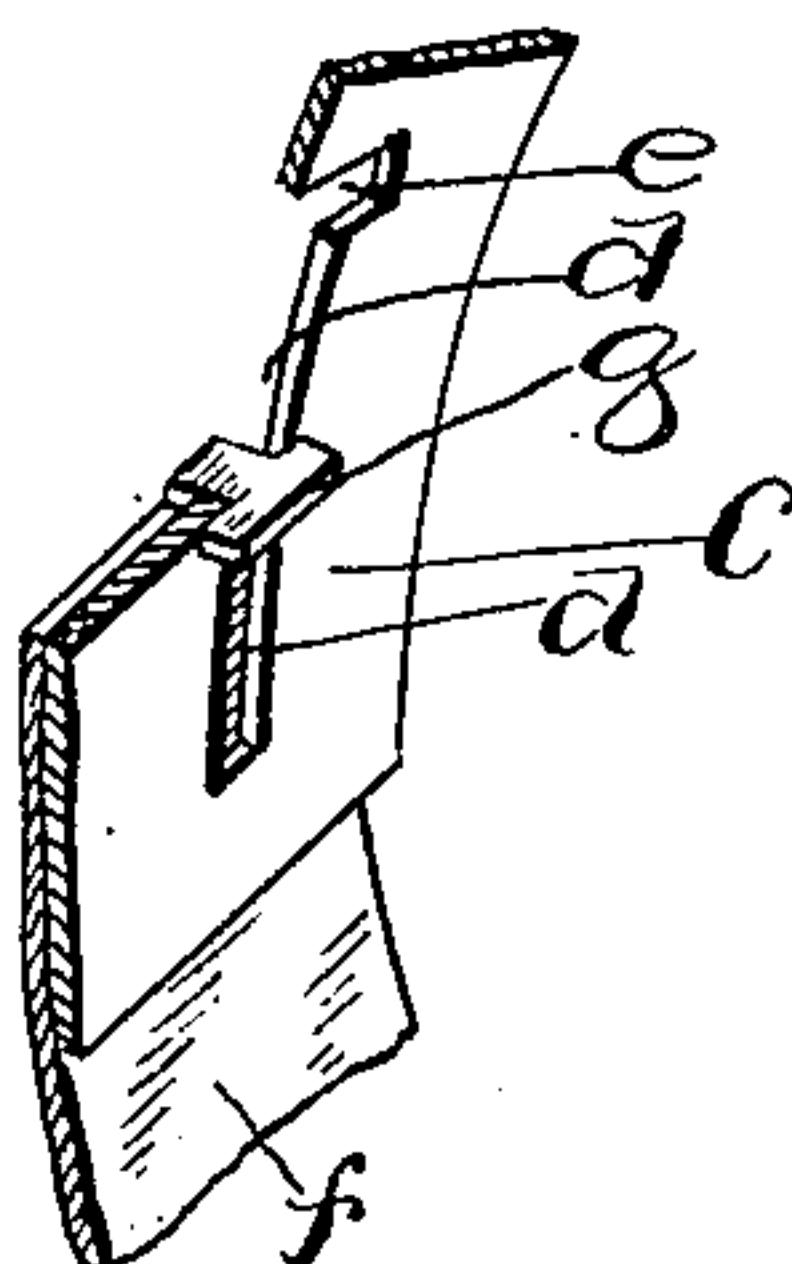


Fig. 3.

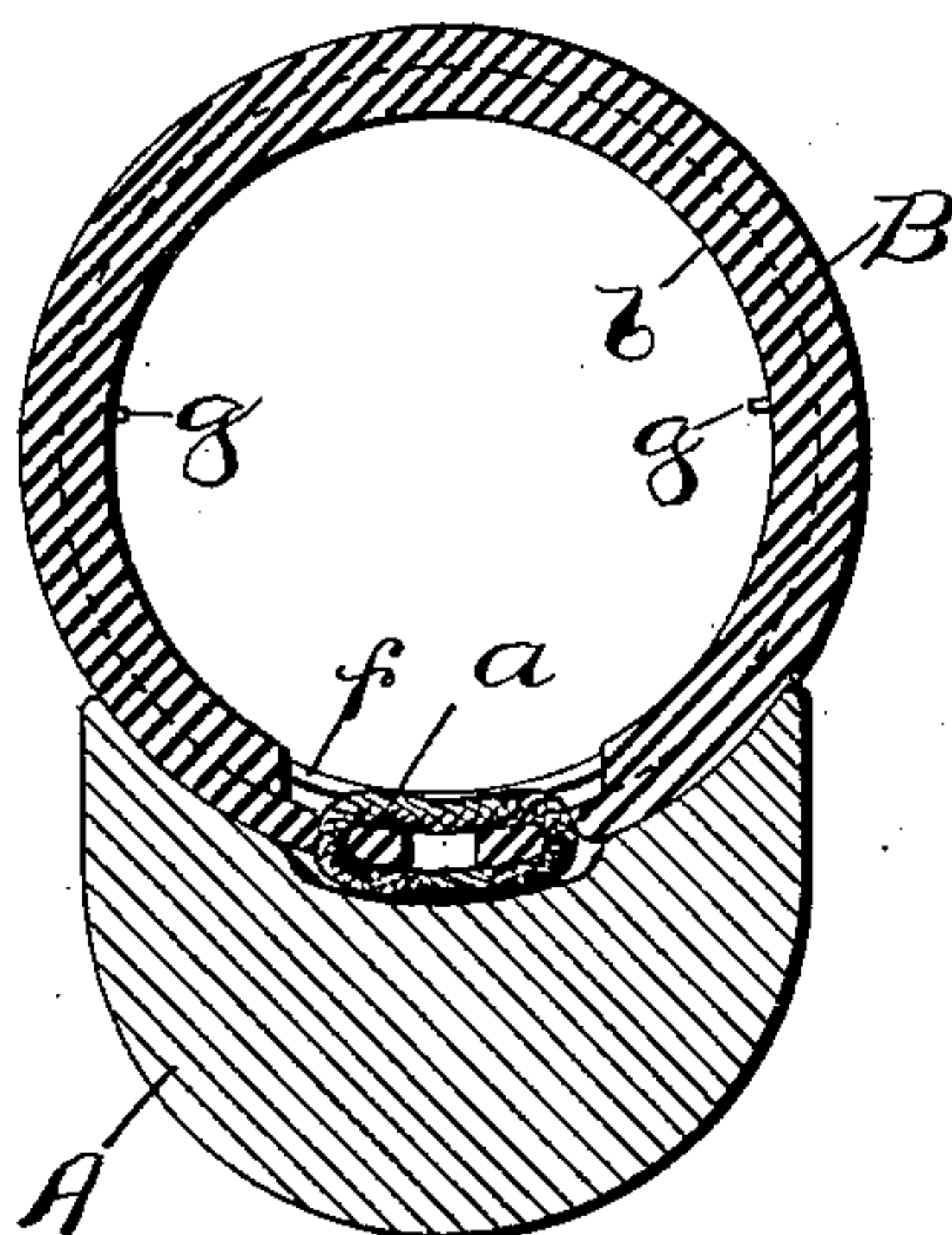


Fig. 5.

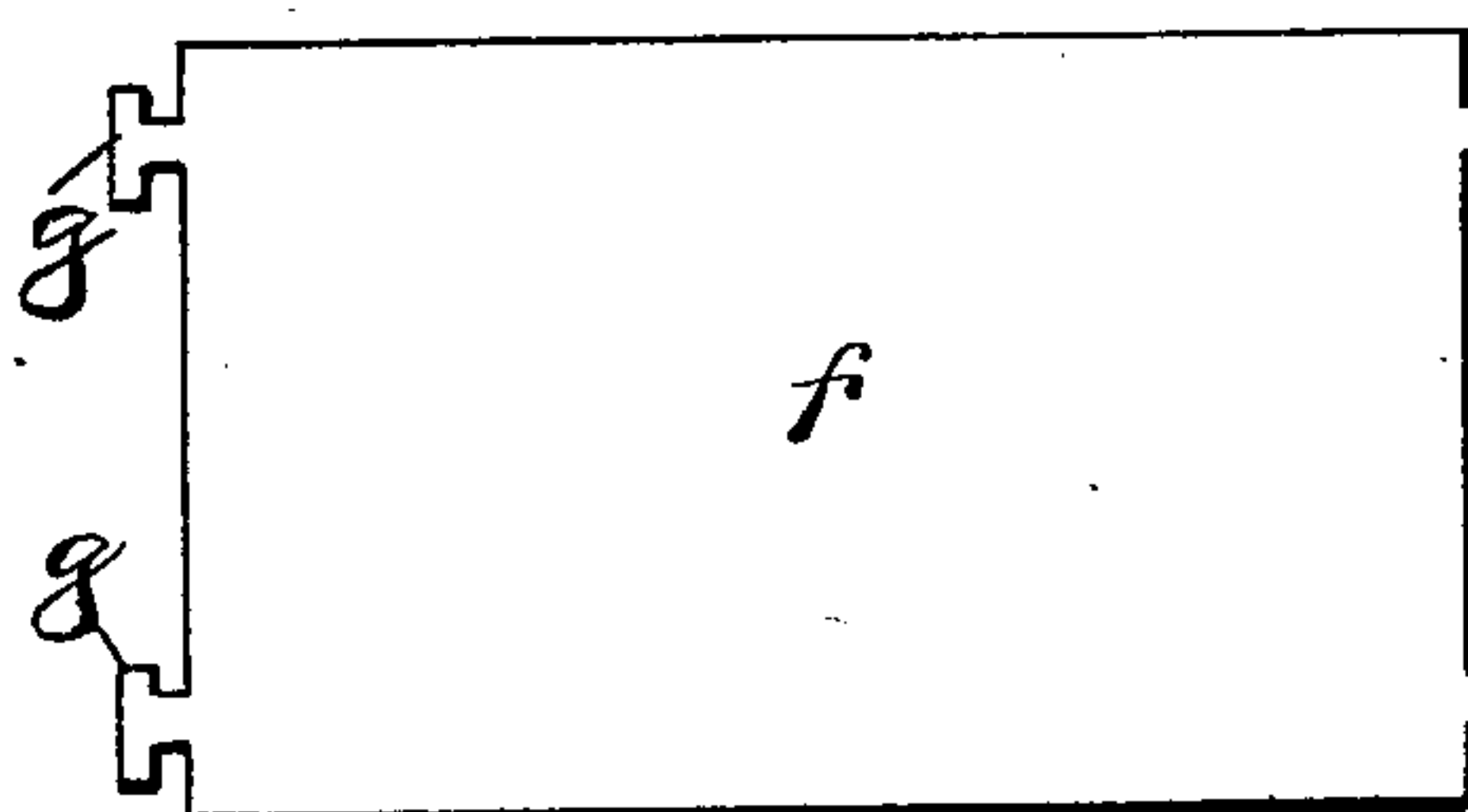
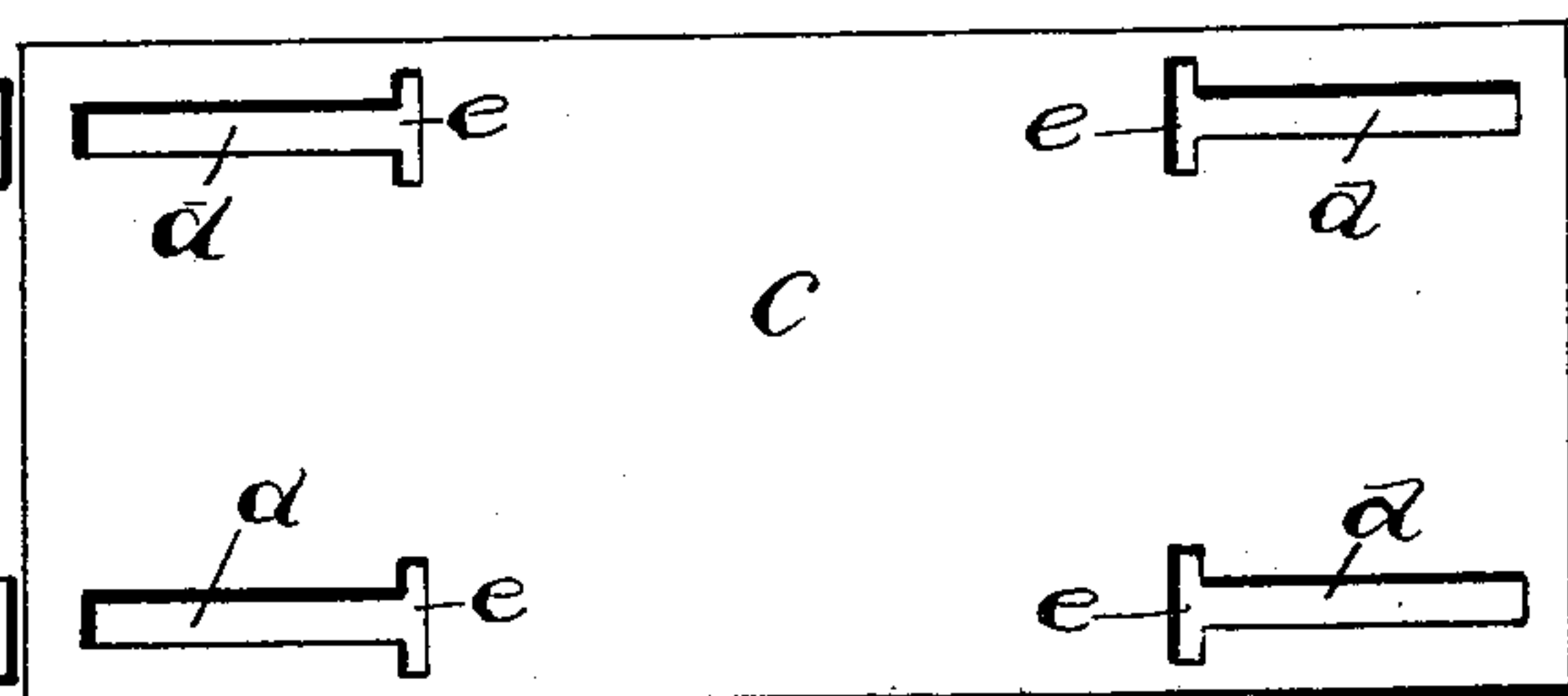


Fig. 6.



Witnesses:

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# UNITED STATES PATENT OFFICE.

HYMAN LIEBERTHAL, OF CHICAGO, ILLINOIS.

## WHEEL.

SPECIFICATION forming part of Letters Patent No. 680,256, dated August 13, 1901.

Application filed June 15, 1901. Serial No. 64,956. (No model.)

*To all whom it may concern:*

Be it known that I, HYMAN LIEBERTHAL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wheels, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to wheels designed primarily for use on bicycles, but which may be used with other styles of vehicles where it is desirable to provide for as great freedom as possible from jolts and jars incident to the passing over of uneven roads or over obstructions in the path of the wheel.

This invention relates to improvements upon the construction shown in my pending application, filed May 13, 1901, Serial No. 59,976 of the series of 1900. As in my said pending application, I employ in this invention a series of springs, each spring being composed of a flat strip of metal suitably curved or bowed.

One of the objects of my present invention is to provide improved means for retaining the springs in their proper curved or bowed position and at the same time allowing for the ready disengagement and withdrawal of any spring or number of springs for the purposes of repair or replacement.

Another object of my present invention is to provide the ordinary flexible covering on its interior with devices for holding the said springs apart, so that they cannot possibly interfere one with the other, no matter what force or blow be imparted to the outside of said covering when the vehicle is in use, thereby insuring each of said series of springs being always retained in its proper position relative to the other springs and to the rim.

I accomplish these objects by the means shown in the drawings and hereinafter specifically described.

That which I regard as new will be set forth in the claims.

Referring to said drawings, Figure 1 is a perspective view of a portion of an ordinary wheel-rim having upon its periphery a tire embodying my improvements, a portion of the tire, as shown, being broken away. Figs. 2 and 3 are cross-sections through the devices of Fig. 1, Fig. 2 being taken at the edge of

one of the springs, so as to show the spring, and Fig. 3 being taken through one of the strips on the inside of the covering. Fig. 4 is a detail, being a perspective view of a portion of one of the springs and the base to which it is attached. Fig. 5 is a plan view of a blank from which a spring-base is formed, and Fig. 6 is a plan view of a blank from which one of the springs is formed.

In the drawings, A indicates a wheel-rim of ordinary construction, upon the periphery of which is adapted to be mounted a tire.

B indicates the tire-covering, made of flexible material, as usual, the two edges of which after the insertion in place of the devices hereinafter described are adapted to be drawn together and held by lacing-cords *a*, passing through holes near said edges, or by any other suitable means, the edges thus secured being arranged, as usual, against the upper face of the rim A, so as to be out of sight. Upon the interior of the covering B and extending transversely thereof and preferably formed therewith are a series of strips *b*, the ends of which, as shown, approach within a short distance of the edges of the flexible covering B. These strips *b* are to be arranged at regular distances from each other, the spaces between them being of a width to adapt the springs and their bases that will be hereinafter described to be located between them and allow the springs as they are compressed from time to time to move freely toward and away from the longitudinal center of the rim.

*c* indicates a series of curved or bowed springs, each formed from a single piece of sheet metal, and each of said springs being, before being bowed or curved, as shown in Fig. 6. At opposite ends of each spring and extending longitudinally of the spring is formed a slot or slots *d*, two of such slots being preferably employed, as shown. Each slot *d* is enlarged laterally, as indicated at *e*.

*f* indicates a series of curved bases, one for each spring *c*, each base-piece being formed from a single piece of sheet metal which before being curved into shape is as shown in Fig. 5. Upon each end of each base are formed projections *g*, consisting of a head portion and a neck portion, as shown. These projections are bent inward and are so located that when the parts are in place the neck por-



tions of the projections will be adapted to move in the slots *d* of the springs. In uniting the springs and the bases the enlarged or head portions of the projections, which, as described, project inward, can be passed through the enlarged portions *e* of the slots *d*, and then as the springs are moved to bring the head portions of the projections *g* away from the openings *e* it is evident that the springs and the bases will be firmly secured together and at the same time allow the required movement of the springs as they are compressed when the wheel is in use. By the provision of the transversely-arranged strips *b* on the interior of the flexible covering *B* the springs are effectually prevented from contacting with each other at any time, and each spring is adapted to move freely when pressure is applied to it in the use of the wheel. These strips also act to hold the spring-bases *f* between them, so that while said bases are carried by the rim of the wheel it is not necessary to screw or otherwise directly secure them to such rim, as shown and described in my said former application.

A single slot at each end of the spring and a single engaging projection at each end of the spring-base could be employed; but I prefer to employ two of each, as shown, as a more perfect movement of the spring is thereby insured.

It is evident that in case of breakage of one of the springs or bases or damage to the same access can easily and quickly be had to the interior of the covering for the purpose of making repairs, as all that is necessary to do is to remove the tire and open up the covering opposite the damaged or broken part sufficiently to allow of the removal of such broken part and the insertion of a new one, and in doing this none of the other springs or their bases need be disturbed.

By my invention I provide a wheel with a tire of great resiliency and avoid the discomforts attendant upon the use of the ordinary pneumatic tire, which arise frequently from such tire being punctured, and thereby allowing air to escape.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the rim of a wheel, of a series of curved bases carried by the rim, a series of springs, each adapted to have its ends movably held against one of said bases, a connection between each spring and its base, comprising a projection on one of said parts and a slot in the other part, into which slot said projection is adapted to enter, and a suitable covering for the series of springs, substantially as specified.

2. The combination with the rim of a wheel, of a series of curved bases carried by said rim, a series of slotted springs each adapted to have its ends movably held within one of said bases, projections on the ends of said bases adapted to enter the slots in said springs, and a suitable covering for the series of springs, substantially as specified.

3. The combination with the rim of a wheel, of a series of curved bases carried by said rim, a series of springs arranged over and upon said bases, each base having a projection at its end and each spring having a slot extending longitudinally of the spring, into which slot said projection on the base is adapted to enter, and a suitable covering for the series of springs, substantially as specified.

4. The combination with the rim of a wheel, of a series of curved bases carried by said rim, a series of springs arranged over and upon said bases, each member of one of said series being provided with a slot enlarged at one end, and each member of the other of said series being provided with a projection having an enlarged outer end adapted to enter the enlarged end of the slot in the opposite member, and a suitable covering for the series of springs, substantially as specified.

5. The combination with the rim of a wheel, of a series of curved spring-plates, a series of bases in which said spring-plates are adapted to move, and a flexible covering provided on its interior with a series of transverse strips, a spring-plate and its base being arranged in each space between said strips, substantially as specified.

HYMAN LIEBERTHAL.

Witnesses:

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